Waste Stream Analysis

Target Level:
Grade 6

SOLs:
Science: 6.11
(can be easily adapted to 4.8 and younger grades)

Materials Needed:
- Large plastic or paper tarp
- plastic gloves for each student
- one or more waste containers filled with garbage
- bathroom scale

Vocabulary Words:
- incinerator
- landfill
- waste stream

Preparation

Collect one or more containers of "clean" household garbage.

Precaution

Due to the possibility of used tissues or broken glass or other sharp objects present, the teacher should provide the trash can or bag for the students to examine. Sort through the classroom trash can and remove all tissues and sharp objects or bring in a bag of garbage from home after removing any items that the students should not be handling (e.g., dirty tissues, diapers, glass of any type, etc.).

Procedure

1. Spread the tarp or plastic out on the floor and dump the classroom waste-basket out in front of the class. Once the garbage is spread out in front of the students, have students put on gloves and assist with sorting the garbage. Separate the trash into as many categories as possible, including non-recyclable and recyclable, reusable, etc. You can use the categories on the data sheet or have the students determine their own categories during this sorting process. Weigh each group of wastes.
2. Leaving the trash spread out and visible, discuss the amount and types of garbage you found. Using the data on the breakdown of Municipal Solid Waste in the United States, compare the classroom sample with national waste composition.
3. Discuss which waste categories could be eliminated by reusing, recycling, or composting.
4. Give each student a data collection page and ask them to keep track of their family's garbage as it is thrown away or placed in the compost or recycling bin. (Allow 2-3 days for completion; if possible, schedule over the weekend). Collect the data sheets and determine a class average for each category. You might want to have information on family size as well. Obviously a family of 4 will produce less waste than a family of 6. Graph the results. Compare this average with the classroom breakdown and also with the national waste composition.
5. Use math skills to determine weights and percentages of materials.
6. Once you have determined how much waste is produced by your class and how much can be removed from the waste stream by recycling, reusing and composting, you can use this data to make an estimate about the amount of waste produced by all classes in the school and all families in the community, and how much can be prevented from going to the landfill or incinerator.

Follow-up Questions and Review

1. Which category represents the largest amount of garbage?
2. Name differences in the types of waste produced at school and at home.
3. How do your results differ from the national averages?
4. Do you see any reason why your results might be different?
   (examples are: curbside recycling available in your community; season of year analysis is done — there is less yard waste during winter

Garbage Data Form

Name _____ ***Number of People in Household*** _____

Number of Days of Trash Examined (must be 24 hours or more) _____

Did you include the items in a recycling bin? ❑ Yes ❑ No In a separate composting container? ❑ Yes ❑ No
Did your family have a special event during the days for the analysis (example: birthday party; spring cleaning; trip to the grocery store; etc) ❑ Yes ❑ No If yes, please describe: _____

Item	#Items	Weight	Recycle	Non-recycle	Compostable	Preventable
White Paper						
Colored Paper						
Newsprint						
Other Paper						
Cardboard						
Glass Containers						
Aluminum						
Other Metals						
Food Waste						
Cleaning Supplies						
Yard Waste						
Milk/Drink Boxes/Bottles						
Construction Debris						
Scrap Metal						
Recyclable Plastics (by#)						
Non-recyclable Plastics						
Lunch Trays						
Scrap Paper/Magazines						
Other (list)						
Totals						

Total Weight of All Materials: _____
Total Weight of All Recyclables: _____ % of total weight: _____
Total Weight of Non-Recyclables: _____ % of total weight: _____
Total Weight of Compostable: _____ % of total weight: _____
Total Weight of Preventable: _____ % of total weight: _____

Discussion

Discuss why there may be differences among families. In any of the families was there an event that happened that could cause a temporary increase in garbage production? (possibilities: birthday party, trip to grocery store, monthly pizza celebration, etc.)

Conclusion

What is the biggest source of waste in your school and in your home? Can you make suggestions on how to reduce any of these sources of waste